



**CTIS** | A HEALTH  
INFORMATICS  
COMPANY

Proven Solutions. Improved Results.



## Why CTIS?

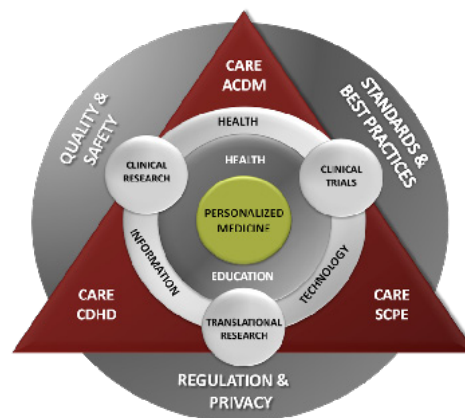
Because our experience in the health informatics arena allows us to deliver comprehensive, tailored solutions that separate us from our competitors. We're passionate about the work we do. With every solution we design, with every system we develop, and with every global, national, or local program we implement, we seize the opportunity to improve and save lives. Our passion stems from the fact that we—the community of CTIS—come from the very same communities that our clients want to reach. More importantly, our passion compels us to deliver the solutions that global communities need.

## WHO WE ARE

### ABOUT US

CTIS has over 20 years of proven history in providing total informatics solutions to the health sector. CTIS provides innovative, appropriate, timely, and quality information technology solutions to health systems, health professionals, research organizations, and payors to support their goals in serving patients. To address this need, CTIS' informatics solutions converge health sciences, information technology, process reengineering, total quality management, and organizational effectiveness in order to optimize the capture, storage, and use of information in health and biomedical sciences.

CTIS is also building needed personal information solutions that serve patient directly in dealing with their healthcare providers. CTIS' leadership is at the forefront of national discussions that are defining the next generation of biomedical, clinical research, translational research, personalized medicine, comparative effectiveness research, performance driven healthcare, health disparities, elder care, and chronic disease management programs that will not only provide better patient care, but also meet the cost management goals of the health industry.



• **Personalized Medicine:** Individualized Health Solution  
• **Health Information Technology:** Integration of personalized health information through PHR/EHR  
• **Health Education:** Training and Education of healthcare providers online and continuously

• **Clinical Research (In Vivo/In Vitro):** Discover and Design  
• **Clinical Trials (Phase I, II, III):** Development and Delivery  
• **Translational Research (Bench to Bedside):** Convergence of Health Research and Healthcare

• **CARE ACDM (Quality Care & Patient Safety):** Access, Deliver, Continuity and Management  
• **CARE CDHD (Destination Services & Case Mgmt.):** Chronic Disease and Health Disparity  
• **CARE SCPE (Public Health):** Surveillance, Control, Prevention, Epidemiology

Figure 1: About Us



## VISION

We want to improve the health and wellbeing of people, which is a key challenge that faces our world today. Improving human health will have a profound impact across many other pertinent issues, including economics, education, energy, environment, and security. By advancing healthcare we will also enrich the quality of life for individuals, families, communities, and countries around the world. We believe that the best outcome and the highest return of investment will be delivered by building Individualized Health solutions.

## MISSION

Our mission is to harness the power of information technology, standards, business process reengineering, and total quality management to advance international medical research, clinical care, health research, and public health for the best patient outcome. We intend to emerge as the leading global provider of health informatics solutions by building regulatory compliant health informatics applications that deliver a high return on investment to our clients. Our mission emphasizes faster market delivery of safer, more effective drugs and clinical care process improvement by continuously expanding our proven processes and best practices across the health industry.

## PHILOSOPHY

We are committed to excellence by building the best informatics systems that deliver the highest outcomes. By integrating the best use of technology, architecture, information, processes, and standards delivered through best-of-breed human resources, these systems improve productivity and streamline processes while maintaining the highest quality of data and ensuring the safety of patients involved. All of these elements enable CTIS to facilitate better medical decisions amongst health and science professionals.

## VALUE PROPOSITION

CTIS wants to provide its clients with the highest value and return from their investments; we want to ensure that they achieve clear, tangible results through our innovative products and services by combining the right team and the right approach to deliver the right results. With every solution we design, with every system we develop, and with every global, national, or local program we implement, we seize the opportunity to improve and save lives.

Our value proposition delivery components include:

- Faster clinical trials process – Our solutions and streamlined process workflows help bring the drugs to market faster, which enables us to better serve patients sooner.
- Better patient safety during the care and trial process – Our solutions and mobile applications provide better control, collaboration, and coordination between healthcare stakeholders and reduce the chance of any adverse events.
- Higher clinical data integrity – Our solutions and its interoperability-based connectivity eliminates redundant methods and insures that data is of highest quality and accurate, resulting in better evidence based outcomes.
- Road tested by the toughest customer in the world – We have over 20 years of experience and have received numerous notable achievements for best practice, informatics, technology, and communication websites, thus establishing CTIS as a proven and performance enterprise.

## CUSTOMERS

CTIS has a continued commitment to our clients and customers. In order to serve this purpose, we have built many mutually-beneficial relationships with companies that we believe complement and enhance our expertise in the areas of health information technology services and health informatics solutions. We offer our clients more comprehensive and innovative solutions that help them decrease time to market, improve performance, and access information more effectively. When customers ask us how to maximize their business and technology potential – CTIS has the answers.

### GOVERNMENT (NIH & OTHER GOVERNMENT SECTORS)

CTIS is currently serving the three largest institutes of National Institutes of Health (NIH) that constitute about 43% of the total NIH budget -- NCI, NHLBI, and NIAID. CTIS is expanding its client base to other NIH Institutes and government sectors, such as Department of Veterans Affairs (VA), Department of Defense (DOD), Nationwide Health Information Network (NHIN), and US Army Medical Research and Materiel Command (USAMRMC), that are actively involved in mobile applications and disease management activities.



### COMMERCIAL

CTIS has designed and developed various Electronic Data Capture and CTRM systems for clinical research centers and other subgroups within pharmaceutical companies, hospitals, biotech organizations, academic medical institutes, contract research organizations, and site management organizations, providing clinical trial support at the site level.



### INTERNATIONAL

CTIS has worked on many projects at the international level and provided some of the best solutions/systems for governments, foundations, and other entities involved in sponsoring international health research such as:

- PEPFAR – Patient Management and Monitoring (PMM) for GHAIN & ACTION, Nigeria
- Regional Competitiveness Initiative, Europe and Eurasia
- INCTR -Acute Lymphoblastic Leukemia(ALL), Belgium and India
- Network for Surveillance of Pneumococcal Disease Project with Johns Hopkins University, Eastern Africa
- The Division of Cancer Epidemiology and Genetics - Management System (SMS), India
- King Hussein Cancer Center, Jordan
- Prevention System for National Cancer Institute of Lima, Peru
- Indian Health Information Network Development Portal for National Knowledge Commission, India
- International Spirit of Life Foundation (ISOLF)
- Open Educational Resources for Cancer (OERC)
- Division of AIDS Program with NIAID in 20 countries (Botswana, Brazil, Cambodia, China, Dominican Republic, Haiti, India, Jamaica, Kenya, Malawi, Panama, Peru, Senegal, South Africa, Tanzania, Thailand, Uganda, United States, Zambia, and Zimbabwe)





## ACCOMPLISHMENTS

We are proud of our achievements, awards, and recognitions over the past 5 years. Our most important recognition comes from serving our clients and knowing that we are a partner in growing their businesses.

CTIS built the Cancer Therapy Evaluation Program (CTEP) - Enterprise System (CTEP-ESYS) and the CTIS Chief Information Officer (CIO) received [two National Institutes of Health \(NIH\) Director's Award](#) in recognition of developing and implementing the state-of-the-art CTEP-ESYS IT system and another one for IT Infrastructure.

CTEP-ESYS received the highest score ever for Capital Planning and Investment Control (CPIC): 9.7 out of 10. For all DHHS investments, the [CTEP-ESYS ranked fourth overall](#) (out of 75 major investments) and second out of 214 total investments at the NIH.

CTIS received the [Computerworld Best Practice Award](#) in the area of Security, Risk Management, and Business Continuity/Dynamic Information for their work on CTEP, NCI.

CTIS has been in the [Top 10% of OMB 300 IT Investment Rating for the past 3 years](#) for their work on CTEP, NCI, and across the Department of Health and Human Services IT Investments Portfolio.

NIH, in response to the Government Performance and Results Act (GPRA), prepares yearly performance plans and reports. CTIS is [rated exceptional](#) (highest level) five years in a row.

CTIS was recognized for the [seventh consecutive year](#) as a member of Deloitte's Fast 50 growing technology companies in Maryland.

CTIS is certified by the National Cancer Institute (NCI) as a [licensed cancer Biomedical Informatics Grid™; \(caBIG®\) Support Service Provider](#) in the areas of Deployment Support for Software Applications, Help Desk Support for Clinical Trials Compatibility Framework, and Training Materials and Services.

CTIS has achieved [CMMI Maturity and Capability Level 3 Certification](#). CMMI is a framework that facilitates communication through integrated models that transcend disciplines.

CTIS has been working together with caBIG™ on various projects. We have currently 4 [Bronze certified applications](#), 2 of which are on course to be Silver certified.

CTIS is a [Microsoft Gold Certified Partner](#), the highest partner level program with Microsoft, for 4 years in a row.

CTIS has [partnered with Oracle](#) in building CTRM informatics solutions for its NIH clients.

CTIS's Center for Information Technology (CIT) Team is [Information Technology Infrastructure Library \(ITIL\)](#) certified and is also a certified partner with Cisco Systems.

# MARKET AREAS

## CLINICAL TRIAL RESEARCH MANAGEMENT

- Taking a drug from “bench-to-bedside” is extensive as it is driven by paper-based processes, causing redundant efforts, disconnected stakeholders, and regulatory burdens
- Over past 20 years, we have successfully provided systems integration services to our clients through:
  - o an incremental and iterative approach
  - o CTRM thought leadership
  - o ability to leverage existing client investments
- Our solutions have proven to reduce organizational redundancy, increase process efficiency, improve trial time, and result in over 250% return on investment to the government.

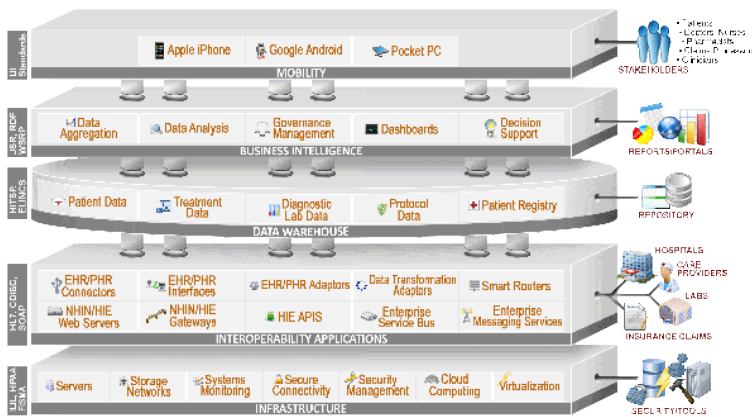


Figure 2: Five-Tier Architecture

## CLINICAL CARE AND MANAGEMENT

- Provide IT applications and human resource capacity that integrate technology and process improvement that delivers high quality, timely, and cost effective solutions and improves the care access, care management, and continuum of care.
- Our Health Information Exchange (HIE) solution:
  - o revolutionizes patient outcomes
  - o improves patient safety
  - o lowers healthcare costs
  - o ensures effective fulfillment of all grants requirements

## HEALTH DISPARITY AND CHRONIC DISEASES MANAGEMENT

- We are at the forefront of creating mechanisms to eliminate health disparity and prevent chronic diseases by addressing some of the core issues:
  - o Integration of fragmented information sharing mechanisms
  - o Forging public and private partnerships
  - o Prevention, by implementing structured awareness and outreach programs
  - o Delivering educational and training tools
  - o Utilizing community organizations
- Our solution focuses on sophisticated molecular analysis and translational research on chronic disease detection, management, and treatment by applying a chronic disease-centric approach to public health burdens and providing innovative and highly collaborative services in many diverse settings.

## TRANSLATIONAL RESEARCH AND PERSONALIZED MEDICINE

- Integration of clinical research and clinical care is dubbed as Translational Research and Personalized Medicine (PM) refers to the tailoring of medical treatment to the individual characteristics of each patient.



- CTIS is participating in building institutions for Translational Research and Genomics in multiple U.S. locations. Our strategy is to create a coalition of partners that can deliver the total solution and lead this transformation as a new paradigm in healthcare.

### HEALTH EDUCATION

- Build a “Learning Healthcare System” to bring the physicians, nurses, and other health workers together.
- Provide continuous education that reflects the changing healthcare landscape.
- Open education resources include access to full courses, training and course modules, research information, and news via web wiki.

### PUBLIC HEALTH SERVICES

- Electronic mechanisms utilized in public health awareness, surveillance, control, and registries will facilitate integration across diseases and disease stages, as well as enhance the needed infrastructure platforms, asset utilization, process streamlining, event monitoring, and endpoint evaluation throughout the stages of surveillance activity.
- We have established informatics database systems that develop integrated electronic public health applications to meet the informatics demands.

### PREVENTION AND EPIDEMIOLOGY

- Convergence of prevention and epidemiology work through the primary care physicians with clinical care and clinical research will provide the best outcome and better collaboration between the patients, physicians, and providers.
- Commitment to build Individualized Healthcare solutions, the systems will gather enough population level information on the patient and the family that will facilitate in conducting virtual epidemiology studies within a given cohort such as the “Virtual Framingham Model” enable prevention and early detection.

### GLOBAL HEALTH

- Management of Global Health is a fundamental requirement in order to effectively deploy our limited resources and provide harmonized care to the larger population in order to strengthen health systems worldwide and reduce inequities.
- CTIS has implemented with its partners to overcome the global limitations by:
  - o Developing global portals
  - o Developing a strategic model through a hub and spoke model
  - o Building a digital health community
  - o Developing computing devices at point of care interface
  - o Conducting online training

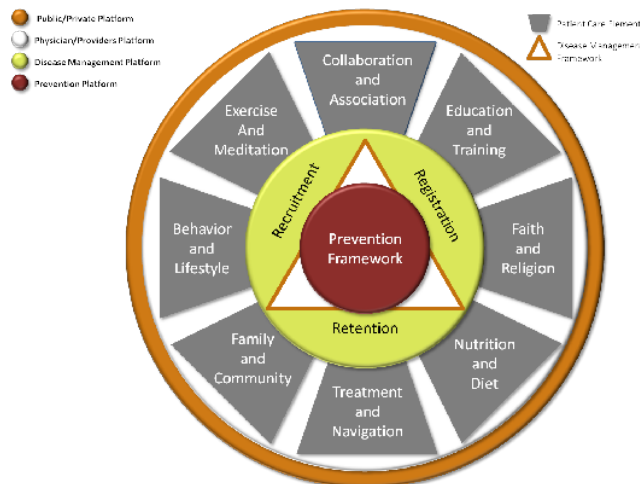


Figure 3: Prevention Framework

## SERVICE AREAS

### THOUGHT LEADERSHIP AND SUBJECT MATTER EXPERTISE

Our Thought Leadership for health informatics helps our customers define the clinical IT vision and roadmap in support of organizational goals to improve patient safety, quality of care, operational efficiencies, patient/physician convenience, and satisfaction in accordance with regulatory standards. As a result, our Thought Leadership provides significant Subject Matter Expertise in health IT, which allows connected, collaborative, and comprehensive management of secured health information.

### PROGRAM MANAGEMENT AND EARNED VALUE MANAGEMENT

Strong leadership, effective management and communication, experienced staff, and emphasized quality service and customer satisfaction are the hallmarks of our methodology. The processes and activities involved in our Integrated Program Management Approach directly align with the Health and Human Services (HHS) Capital Planning and Investment Control (CPIC) process. Our methodology uses Earned Value Management (EVM) standard data elements in order to relate time-phased budgets through Performance Measurement Baseline (PMB).

### DATA WAREHOUSING AND BUSINESS INTELLIGENCE

We build superior solutions that meet Data Warehouse requirements in a cost-effective and timely fashion. Our Business Intelligence/analytics provides stakeholders the ability to access and aggregate the data in meaningful ways to support informed decision-making.

### HEALTH INFORMATICS EXCHANGE (HIE)

HIE promises to revolutionize patient outcomes, improve patient safety, lower healthcare costs, and ensure effective fulfillment of all grants requirements. Our HIE solution facilitate information exchange and interoperability between: a) patients, physicians, payors, providers; and b) Electronic Medical Records (EMRs), Electronic Health Record (EHR), and Personal Health Records (PHRs).

### IT INFRASTRUCTURE AND MANAGED HOSTING SERVICES

CTIS offers a wide range of Managed Hosting Services (MHS) that offer industry standard security, compliance, and best practices. Our MHS is comprised of proven industry-tested solutions that enable clients to consolidate and modernize their existing infrastructure and service offerings, while reducing their total cost of operations.

### SOFTWARE DEVELOPMENT (SD), OPERATIONS, AND MANAGEMENT

We offer SD services to our clients to help them understand business value through best practice, process improvements, cost reduction, and revenue growth. Our SD Team provides application development, business and data architecture, technical architecture, architecture integration, business process reengineering, quality assurance, testing and governance, regulatory compliance, and reporting services.



## CUSTOMER SERVICES

We provide Customer Services support in the areas of communications, training, documentation, and Independent Verification and Validation (IV&V) services, thus improving service quality, increasing morale and motivation, and boosting customer satisfaction, loyalty, and retention.

## SYSTEM INTEGRATION (SI) AND COMMERCIAL-OFF-THE-SHELF (COTS) INTEGRATION

Our SI efforts are customer centric and are specifically and concretely designed to support services integration while reducing redundancy and improving productivity. After evaluating system integration areas to eliminate system redundancy and increase functionality and productivity, we can then select and integrate a COTS solution.

## BUSINESS PROCESS RE-ENGINEERING (BPR) AND ANALYTICS

An important component to a successful BPR project is a sound approach that defines the key tasks and deliverables that need to occur at specific points throughout the project’s duration. BPR becomes the means by which major, cross-functional components of the enterprise are reinvented and involves the joint reengineering of work process and supporting information systems.

## PORTALS AND DASHBOARDS

The use of Digital Dashboards and Web Portals is increasingly seen as a very useful tool not only for sharing documents and project materials across departments and continents, but also to capture project data in terms of tasks to be accomplished and milestones achieved and budget management.

## MOBILE APPLICATIONS

We offer Mobile Applications that provide real-time access to patient outcome data at the point-of-care, allowing providers to make informed decisions efficiently and accurately and improve patient care and treatment outcomes.

## BEST PRACTICES

All of CTIS’ standards, methodologies, frameworks, processes, and best practices are organized as artifacts in a unified manner in the enterprise standards repository (EnSURE™). EnSURE processes are built on institutional knowledge of having developed technical solutions for over 20 years and are certified at CMMI Level 3. CTIS applies the appropriate set of artifacts from EnSURE to its IT Governance, IT Delivery, and IT Operations activities. The figure below depicts how the CPIC elements of Select, Control, and Evaluate are realized through, respectively, the use of EnSURE implementations of ROI and EVC analysis reports, EVM, and Balanced Scorecard reports.



Figure 4: EnSURE™ Framework

## PRODUCTS

### mPHR

mPHR is an innovative and interoperable Personal Health Record (PHR) software solution currently available on both the iPhone and Android OS platforms. It is a simple and intuitive method of recording and analyzing personal health information by providing users with a customizable one-stop shop to manage their information, all in the palm of their hand.

#### Benefits

- By using mPHR, providers can readily access medical histories, lab test results, digitized diagnostic imagery, and reference databases and overcome obstacles associated with globalization and adoption of PHRs in the health care domain
- It digitally captures patient health information and allows real-time exchange between different web-based PHRs and health care providers
- It eliminates the need for redundant patient data entries, resulting in improved efficiency and quality of patient care with reduced cost and errors
- It is designed to seamlessly integrate with commercial PHR repositories, such as Google Health, Microsoft Health Vault and Dossia, and can interact with hospital and clinical research related repositories

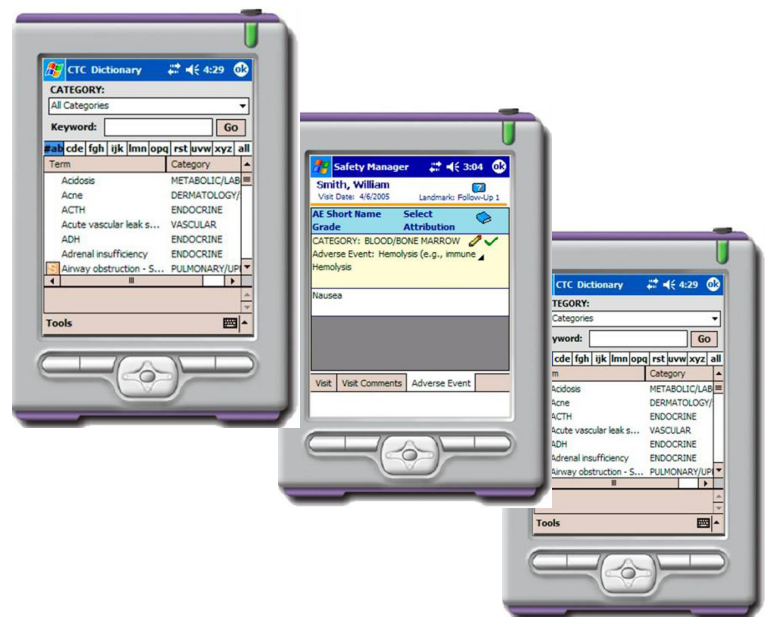


### SAFETY PROFILER

Safety Profiler facilitates the clinical data assessment, grading, and reporting of Adverse Events (AEs) during the clinical trial process. It leverages wireless information technology and ensures the proper capture and coding of AEs for clinical trial professionals. The application also provides workflow management from patient recruitment to visit and AE assignment of attribution; allows electronic access and user guidance to the CTC Dictionary; and provides protocol-specific AE templates and a customizable assessment tool.

#### Benefits

- Safety Profiler is compatible with a range of relevant data standards, including The Common Data Element model, HIPAA, 21 CFR Part 11, and ICH CDISC standards
- Enhances documentation and eliminates rework while minimizing human errors by using automated checks and rules validation
- Reduces time and increases efficiency of work
- Improves data integrity, reduces fragmentation, improves connectivity, and supports mobilization and intervention during the management of AEs.





## THE FUTURE OF CTIS

As a health informatics company, we are at the forefront of a new era in knowledge management. We will pioneer with innovation where IT is no longer an enabler but in fact a driver in changing the paradigm of care in the healthcare industry. We must develop a new paradigm of highly personalized and comprehensive information-based healthcare solution; it will be integrated with and driven by translational and comparative research, both of which are designed to converge life science and healthcare. The new paradigm of care will provide better integration of processes, participation, performance, and price of care at the point of care; this will result in an improved outcome, higher safety, and reduction in cost for the healthcare stakeholders.



Figure 5: Convergence of HIT

This new paradigm of building a patient specific data warehouse will contribute to building a population-based data warehouse that will foster use of analytics and provide substantial business intelligence, enable the extraction of meaningful data, and create useful data sets that can be provided to the physicians and the patients at the point of care through mobile devices. Overall, the integration of Clinical Research, Clinical Care, Public Health, and Health Education through Health Information Technology (HIT) will contribute to a substantial reduction in cost and provide a better standard of care. We expect to be at the forefront of this new paradigm of care with its in-depth capacity and IT process re-engineering and organizational development across the healthcare ecosystem.

We understand that your business needs will drive the technology solutions that you choose. We provide a comprehensive offering of thought leadership, consulting, advisory services, education, and technical support. Our goal is to understand your business as you do and assist you in your efforts. **This is our commitment and our promise.**



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